A Synthesis:
Representational Stages in Child Phonological and Morphological Development

Lecture Review (Hoff text, 4th Ed)
Galasso

Stages of ‘Rule Representation’ Scheme:

1. Phonology
   - Pre-Representational
     - Idiomatic Speech
     - Formulaic Speech
   - Representational
     - Partial rules
     - Full rules

   ‘u-shape’:
   ('pretty')

   Phonological Rules:
   - Assimilation
   - Default voicing
   - Syllabic Development
     (e.g., u-shape learning)
   - weak syllable deletion

   [prIti] /prIti/ /bldi/ [CVCV] [CCVCV]

   Context-bound
   Noun ↔ Determiner
   Verb ↔ Auxiliary/Modal

   [car] ‘car’
   [raisins] [rainsins]-[es]
   [Ø Pl] [+Pl] [Number]
   [formulaic] ‘category’
   ['Iwant'] ‘I’ [Case]

2. Morphology
   - Pre-Representational
   - Representational
     - Lexical
     - Functional
     - Referential

   Word mapping/bootstrapping:
   (p.209ff)
   (p.335ff)

   morphology processing:
   Semantic
   Derivational
   Syntactic
   Inflectional

   teach-{er} teacher-{s}

Data: (Galasso) ‘Sally Exp’
       (Gordon) ‘Rat-eater Exp.’
       fMRI Brain Imaging

Overview: Children first produce language in a pre-representational way whereby both Phonology and Morphology are underdeveloped. Regarding phonology, idiomatic speech such as formulaic, echolalia and mimic expressions are the hallmark of a Pre-Representational stage, usually beginning as early as 14 months and lasting up until 24 months (+/-20%). Regarding Morphology, chunking has been observed whereby young children (up until 24 months) are seemingly unable to partition the morphological segments e.g., [stem-affix] and rather produce both as a single whole chunk—e.g., ‘raisins’ (as a singular word and where the plural {s} is not yet productive).
1. Phonology: Phonemic/Syllabic Development and Consonant Harmony

[1] The early production of the word ‘spaghetti’ offers linguists a valuable insight into the phonological rules children employ at the earliest stages of representational speech.

(a) spaghetti  →  /bʌzɡɛdɪ/

Above, spaghetti /spʌg̩ti/ becomes /bʌzɡɛdɪ/ (CVC+CVCv) with initial /s/ deletion and strategic reinsertion (voiced to /z/) to create the /CVC-CVCv/ structure. Otherwise, (i) if the initial /s/ stays in place, the child is confronted with a /CC/ double consonant onset which might not be available at the given syllabic stage of development, (ii) if the /s/ gets deleted, never again to insert as /z/ for final /C/ of the initial /CVC/ structure, the child then confronts a CVC-VCV /bʌg̩di/ thus losing the preferred CVC proto-word template. (/p/, /t/ become voiced /b/, /d/ by default voicing).

[2] This rule-based representation is similar to what we found regarding U-shape learning of phonology: Phonological U-shape learning (cited from Hildegard, Leopold 1939-1949)

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<tr>
<th>Stage-1</th>
<th>Stage-2</th>
<th>Stage-3</th>
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<tbody>
<tr>
<td>*Pre-representational stage: (MLUw ≥ 2.2)</td>
<td>*Representational stage showing phonetic and syllabic representation (MLUw ≤ 2.5)</td>
<td>*Target grammar (MLUw 2.8)</td>
</tr>
<tr>
<td>/prɪtɪ/</td>
<td>/bldɪ/</td>
<td>/prɪtɪ/</td>
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-- Double consonant CC reduced to a sole consonant onset C (= CV stage of development)
-- Default voicing assimilating the [-voice] bilabial plosives /p/ to [+voice] /b/ and alveolar /t/ to /d/.

[3] There is a child language acquisition stage during which children will engage in assimilation seemingly across vowel/consonant phoneme boundaries in an attempt to auto-segment consonants with consonants or vowels with vowels. Consider some well known examples below:

(p. 166) (a) duck /dʌk/  →  guk /gʌk/ (velarization)  
          [CVC]  [CVC]

(b) Because /bɪkʌz/  →  /pɪkʌ/ : /b/ to /p/ (due to assimilation from /k/).
          [CVC][CVC]

[4] Observed above, autosegmental assimilation (or consonant harmony/velarization) is found whereby the final consonant [+velar, +voiced/fricative] /k/ is affecting the initial consonant [+alveolar, +voiced/fricative] /d/ and making it +velar. (Hence, if you take /d/ and change its place of articulation from +Alveolar to +Velar—keeping all other distinctive features untouched—the resulting phonemic change is /d/ to /g/). It is this kind of evidence that led some linguists to suppose that early children may not segment on a phoneme by phoneme level, but rather may segment and process sound input based on a syllable by syllable level or [CV] to [CV].
Phonological Development & Phonemic Awareness

[5]. For instance, if this is indeed the case, a very young child, say at 2 years of age, may not hear and segment cat /kæːt/ as three different segmental phonemes /k/, /æː/ and /t/, but rather may process /k/ as an initial onset and /æːt/ as a single [vowel&consonant] coda. By segmenting at a larger syllabic level, as opposed to a finer grained phonemic level, this type of autosegmental assimilation may in fact be adult-like in that there indeed are only two perceived adjacent sounds found in the assimilation process—viz., the initial Consonant and Coda /C/, /VC/. (If this is the case, we don’t have to add an additional stipulation that the child crosses over the otherwise segmented vowel boundary during assimilation).

(p. 165) (a) Cat [CVC] → /kæː/ [CV] (due to syllabic development)
(b) because [CVCVC] → /pikʌ/ [CVCV] (due to voiceless assimilation /k/ /p/)
  turning initial voiced /b/ to voiceless /p/ due to adjacent voiceless /k/.

[6] In [5] (a) above, the final [C] /k/ is deleted due to an immature syllabic developmental stage:

<table>
<thead>
<tr>
<th>Stages of Syllabic Development</th>
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<tbody>
<tr>
<td>(0-18m) Pre-Representational/Pre-Linguistic</td>
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<tr>
<td>(i) [CV] (e.g., ba) =&gt; gemination/duplication of [CV: CV]</td>
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<tr>
<td>(ii) [CV;CVi] (e.g., babba)</td>
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<th>(24m+) Representational/Linguistic</th>
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<tr>
<td>(iii) [CVC] (e.g. cat) =&gt; syllabic/proto-word template</td>
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<tr>
<td>(iv) [CV;CVj] (e.g., kitty)</td>
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<tr>
<td>(v) [CCVC]… (e.g., school) =&gt; consonant cluster</td>
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[7] Although three allomorphic phone options are available in presenting the past tense inflection {-ed}—

(i) /d/ as in the word (ple:d/ (played),
(ii) /t/ as in the word /klkt/ (kicked) (showing phonological assimilation), and
(iii) /ld/ otherwise as the default—children start with the /ld/ default form and maintain it up until a certain age of development. Examples of this range from */klkld/ (kicked), */brokld/ (broke), */kepld/ (kept), */sti:ld/ (saw), */kʊklld/ (cooked), etc.

In other words, once children start to employ the phonological rules associated with the past tense {ed}, they over-regularize the /ld/ pronunciation for {ed}.

[8] banana => /nænæ/ is a beautiful example of how such speech could not be based on a memory bottle-neck of sorts (once attributed to such simplified pronunciation). Here, it is the initial unstressed CV structure that has been deleted. Any attempt to suggest that a lack of memory is behind such errors would undoubtedly run into trouble with this example. => weak syllable deletion
2. Morphological Development
(p. 197) [9] Examples of Pre-Representation word category can be found in such usages as early productions of *I+want* where there is seemingly no morpho-phonological segmentation of ‘I+want’. The child seems to be processing this as a chunk [‘Iwant’ + object].

[10] It was initially reported that the early onset of plural {*s} as in the word raisins or ducks (p. ) were instances of formulaic speech without morphological segmentation of [stem + affix]. Evidence that this is the case comes from work such as (Berko) which show over-regularization of morphology—e.g., ‘raisines’, ‘wented’, or /ktʊktɪld/ (= [cooked]+{ed}), /fkɪstɪld/ (=fixed+{ed}).

(p. 185) [11] Context-bound words provide evidence that very young children may not initially classify words into ‘categories’ at all but rather may solely rely on specific semantic associations attributed to particular contexts.

[12] Distinctions in Derivational vs. Inflectional Morphology were reported as seen via our ‘Sally Exp. (Galasso) and ‘Rat-eater’ Exp. (Gordon) (below):

Words such as ‘Paint-s-er’, ‘Rat-s-eater’ are unattested in the data. Children seem to have innate knowledge of [Stem+Derivation+Inflection] ordering. In compounding, only a given stem+stem can bind together, hence *Rat-s-eater is never produced. Only [Lexical+Lexical/Derivational] compounding gets spelled-out with no other Functional/Inflectional intervening affix inserting between stems. In the Gordon Exp. we noted that ‘mice-eater’ did adhere to our stem+stem/derivational rule since ‘mice’ is an irregular plural which functions as a whole/stem and where eater is a lexical product of derivational morphology.

(p.205) [13] Word Mapping (‘Tadpole-frog’ problem): Semantic bootstrapping is when children use ‘word meaning’ to later build-up syntactic categorical classes. Syntactic bootstrapping is when children used a priori knowledge of syntax to discern word meaning.

Chapter Readings Overview:
Ch. 1-2 Introduction: (Sally Experiment, Berko, Brain Processing (Broca/Wernicke’s area as correlated to specific language tasks), Brain development, Human language as opposed to animal communication.

Ch. 4 Phonology (Ch. 9 p. 330): IPA charts (minimal pairs), Phonological rules (assimilation). Phonological Categorical Perception (handout and experiment), Speech development.

Ch. 5 Morphology (Ch. 9 p. 333) Lexical vs. Functional word class and Development, Word mapping (semantic vs. syntactic bootstrapping), Derivational vs. Inflectional morphology.

Lecture Notes.